

Angular-Interstitial Pregnancy Treated With Minimally Invasive Surgery After Adjuvant Methotrexate Medical Therapy

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ABSTRACT

Background: Angular-interstitial pregnancy is a rare and potentially dangerous occurrence of ectopic pregnancy for which appropriate treatment has not been established.

Methods: A 41-year-old woman with a history of ectopic pregnancy was treated with a combined regimen of conservative treatment comprising medical therapy with methotrexate and a minimally invasive laparoscopic-assisted surgical approach.

Results The patient had an unremarkable postoperative course and was discharged after 32 hours. A transvaginal ultrasound scan control 2 weeks later revealed a normal uterine wall, with normal uterine adnexa.

Conclusion: With our combined treatment approach we avoided hysterectomy, and we achieved a more adequate uterine repair, improving future fertility.

Key Words: Angular-interstitial pregnancy, Methotrexate, Laparoscopy, Mini-laparotomy

INTRODUCTION

Angular-interstitial pregnancy accounts for 2% of all ectopic pregnancies and can occur in the tubal horn of the uterus or in the short, thin interstitial tract of the Fallopian tube.¹⁻³

Angular pregnancy occurs when the embryo is implanted medial to the uterotubal junction in the lateral angle of the uterine cavity, close to the internal ostium of the fallopian tube. The interstitial part is 0.7-mm wide and approximately 1-cm to 2-cm long with a slightly tortuous course, extending obliquely upward and outward from the uterine cavity. Tubal rupture usually occurs between 7 and 16 gestational weeks, and at this time rupture results in a catastrophic hemorrhage with 2% to 2.5% maternal mortality.³

We report a case of cornual pregnancy successfully treated with a combination of medical and minimally invasive conservative approach.

METHODS

A 41-year-old woman, gravida 2, para 0, was admitted to the Obstetrics and Gynecology University Hospital of Ancona 6 weeks after her last menstrual period because of acute cramping in the lower abdomen and pelvic pain without vaginal bleeding. Four years earlier, the same patient underwent a laparoscopic left salpingotomy because of a tubal pregnancy.

On abdominal examination, tenderness was present in the left iliac fossa. Vaginal examination revealed no cervical excitation, but there was left adnexal tenderness. On admission, a transvaginal ultrasound examination (6.5-Hz transvaginal probe, Esaote Diagnostic Ultrasounds, Italy) showed a single gestation sac with yolk sac and fetal pole lateral to the endometrial stripe, raising suspicion of a left cornual pregnancy. In particular, the gestation sac was eccentrically placed in the left-interstitial portion of the uterus, extending posteriorly along the cornual region. It was 41x39 mm in diameter and contained a 16-mm embryo without cardiac activity as of 8 gestational weeks. The embryo, however, was surrounded by a rich peritrophoblastic flow called "ring of fire." Both ovaries ap-

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peared normal, and there were no adnexal masses or free fluid in the cul de sac (**Figure 1**).

The starting β -hCG level was 43139 IU/L, and hemoglobin level was 12.8 g/dL. The clinical assessment indicated the presence of a cornual pregnancy. The woman voiced her strong desire for future childbearing, and she was counseled regarding all established and putative treatment regimens; she elected to proceed with a combined treatment regimen.

The patient was first treated with methotrexate (Metotresato, TEVA Pharmaceutics, Milano, Italy) IM at a dosage of 1mg/kg of body weight on days 0, 2, 4, 6 in association with folic acid IM 0.1mg/kg of body weight on days 1, 3, 5, 7.

Two days after the first dose of methotrexate, the β -hCG serum level fell to 22680 IU/L. On the fourth day after the beginning of medical treatment, the β -hCG serum level was 34281 IU/L, and the patient's hemoglobin level remained stable (12.3 g/dL). During this first part of the treatment, the patient was hospitalized.

The following day after the end of the medical treatment, a diagnostic hysteroscopy and a laparoscopy were performed. With the patient under general anesthesia, first we performed a diagnostic hysteroscopy that revealed an empty uterine cavity without the identification of a left tubal ostium because of a "bombe" on the left cornual region. Then we proceeded with laparoscopy that confirmed a left-sided cornual ectopic pregnancy. After pneumoperitoneum, the left cornua was identified and appeared enlarged with numerous superficial vessels. The right Fallopian tube and the ovaries appeared normal, and no blood was present in the pouch of Douglas. Left salpingectomy and left cornuostomy by cleansing were performed with an Ultracision Harmonic scalpel (Ethicon

Endosurgery, USA) with minimal bleeding. A double-layer of absorbable suture material was placed in a laparoscopically assisted manner in the left uterine horn through an ultra mini-Pfannenstiel incision 30mm in length from the central trocar hole, with complete reconstruction of the uterine wall.

RESULTS

The patient had an unremarkable postoperative course and was discharged after 32 hours when the serum β -hCG level had dropped to 3423 IU/L and the hemoglobin value was 11.2 g/dL. Over the next 4 weeks, the serum β -hCG level appropriately declined to a negative value. The histology confirmed the presence of a conception.

A transvaginal ultrasound scan control 2 weeks later revealed a normal uterine wall, with normal uterine adnexa (**Figure 2**).

Three months after the procedure, an office hysteroscopy and hysterosalpingography were performed revealing a normal uterine cavity and right patent tube.

DISCUSSION

The treatment options for ectopic pregnancy, for its heterogeneous nature in terms of population, patient choice, risk factors, and desire of future pregnancies, are different. Established, accepted guidelines exist for the treatment of the most common type of ectopic pregnancy, which occurs in the fallopian tubes. On the other hand, cornual pregnancy is a rare and potentially dangerous occurrence of ectopic pregnancy for which appropriate treatment has not been established.

Interstitial pregnancy traditionally has been treated by cornual resection or hysterectomy. With the improvement

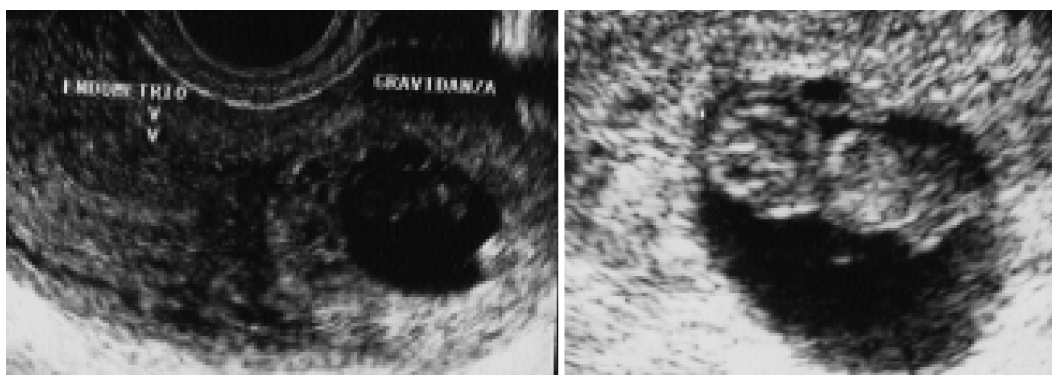


Figure 1. Transvaginal ultrasound scan revealing angular-interstitial pregnancy.

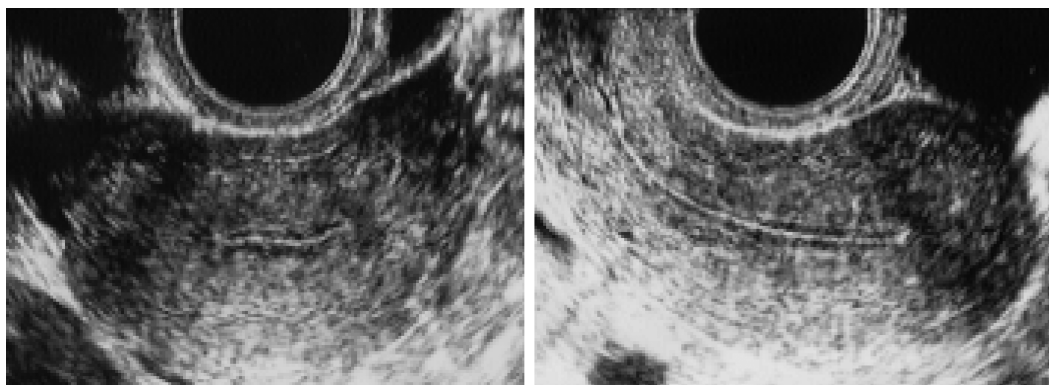


Figure 2. Transvaginal ultrasound scan control two weeks after the combined treatment.

in both technology and surgical skill, cornual resection has been performed laparoscopically. In 1988, Reich et al⁴ reported the first cases managed laparoscopically. The techniques used involved laparoscopic cornual resection with bipolar forceps and scissors and removal through a colpotomy incision, or laparoscopic cornual resection by using a unipolar knife after the injection of vasopressin into the myometrium. However, cornual resection produces a full-thickness uterine incision and ultimately seems to decrease fertility rates. A trend in the last few years has been to use conservative surgical alternatives to cornual resection to increase future fertility and decrease injury to the uterus.

These current standard conservative surgical options vary for laparoscopic treatment with or without cornuostomy and hysteroscopy either alone or with ultrasonographic guidance^{5,6}; a combination of surgical therapies has also been used.⁷

Usually this more conservative approach is in relation to an early diagnosis of interstitial pregnancy. In fact, this approach was performed in patients with serum β -hCG levels between 7572 ± 5758 IU/L, when the duration of amenorrhea was 54 ± 16 days, and the diameter of interstitial pregnancy was 3.1 ± 1.6 cm.⁸

Tanaka et al⁹ in 1982 reported the first interstitial pregnancy treated successfully with multiple doses of methotrexate.⁹ Others later used this approach, and the literature reports a success rate of 80% with a serum β -hCG level of 14141 ± 19202 IU/L and a duration of amenorrhea of 57 ± 22 days.⁸ However, because of the potential for dramatic outcomes associated with failure of medical management, surgery remains the mainstay of treatment.

In our case, we had a 41-year-old woman who wanted future pregnancies, with a previous ectopic pregnancy in

the same tube, with a serum β -hCG level of 43139 IU/L, interstitial pregnancy of 4.1 cm in diameter, surrounded by a rich vascularization known as “ring of fire” and with the duration of amenorrhea of 56 days.

In relation to our findings, the probability of hysterectomy was very high with an immediate surgical approach. So we chose a combined approach, surgery preceded by medical treatment with methotrexate intramuscular systemic regimen. The objective of medical treatment was to reduce cell replication and the vascular flow of the ectopic trophoblastic tissue.

After medical management, the serum β -hCG level was slightly decreased and the diameter of the ectopic pregnancy was not modified. On the other hand, the peritrophoblastic vascular flow of the interstitial pregnancy was drastically decreased compared with vascular flow on admission.

The surgical approach included diagnostic hysteroscopy and laparoscopy with left salpingectomy and cornuostomy. First, we performed a diagnostic hysteroscopy to control the uterine cavity and better define the localization of the ectopic pregnancy. Then, we performed laparoscopic salpingectomy by using Ultracision forceps without the need of vasopressin myometrial injection because methotrexate had already decreased the vascular flow, minimizing blood loss and improving visibility during the operation. We performed a salpingectomy in accordance with the Royal College of Obstetricians and Gynaecologists' recommendation that salpingectomy must be performed if the contralateral tube is healthy^{10–12} in patients with a previous ectopic pregnancy in the same tube. In fact, the rate of ectopic pregnancy is increased after salpingostomy,¹³ and the risk of persistent ectopic pregnancy after salpingostomy increases in 4% to 15% of women.¹⁴

An Ultracision scalpel was then used to open the myometrium of the left cornua and clean it of trophoblastic tissue.

The second step of the surgery was to suture the left uterine horn throughout by performing a laparoscopically assisted ultra mini-Pfannenstiel incision. A portion of the uterus was exteriorized through the ultra mini-Pfannenstiel incision, and then sutured in a double layer because its integrity seems to be very important to prevent uterine rupture in subsequent pregnancies.

The patient was discharged after 32 hours, and the post-operative follow-up has been uneventful. At 3-month follow-up, an office hysteroscopy and hysterosalpingography were performed revealing a normal uterine cavity and patent right tube.

CONCLUSION

This report presents our experience with the management of an interstitial pregnancy. We think that with this kind of approach, medical first followed by minimally invasive surgery, we avoided having to perform a hysterectomy, saving the uterus, and minimizing blood loss. Furthermore, by using the ultra mini-Pfannenstiel approach, we achieved a more adequate uterine repair, improving future fertility and possibly decreasing the risk of uterine rupture during the next gestation or during labor.

References:

1. Grobman WA, Milad MP. Conservative laparoscopic management of a large cornual ectopic pregnancy. *Hum Reprod.* 1998;13(7):2002–2004.
2. Bangsgaard N, Lund CO, Ottesen B, Nilas L. Improved fertility following conservative surgical treatment of ectopic pregnancy. *Br J Obstet Gynaecol.* 2003;110:765–770.
3. Tulandi T, Saleh A. Surgical management of ectopic pregnancy. *Clin Obstet Gynecol.* 1999;42:31–38.
4. Reich H, Johns DA, DeCaprio J, McGlynn F, Reich E. Laparoscopic treatment of 109 consecutive ectopic pregnancies. *J Reprod Med.* 1988;33:885–90.
5. Moon HS, Choi YJ, Park YH, Kim SG. New simple endoscopic operation for interstitial pregnancies. *Am J Obstet Gynecol.* 2000;182:114–121.
6. Matsuzaki S, Fukaya T, Murakami T, Yajima A. Laparoscopic cornuostomy for interstitial pregnancy. A case report. *J Reprod Med.* 1999;44:981–982.
7. Bremner T, Cela V, Luciano AA. Surgical management of interstitial pregnancy. *J Am Assoc Gynecol Laparosc.* 2000;7:387–389.
8. Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril.* 1999;72:207–215.
9. Tanaka T, Hayashi H, Kutsuzawa T, Fujimoto S, Ichinoe K. Treatment of interstitial ectopic pregnancy with methotrexate: report of a successful case. *Fertil Steril.* 1982;37:851–852.
10. ACOG Committee on Practice Bulletins-Obstetrics. *American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin.* Washington, DC: ACOG. Number 3. December 1998.
11. *Royal College of Obstetricians and Gynaecologists (RCOG) Clinical Guideline No. 21.* London, UK: RCOG Press; May 2004.
12. Farquhar CM. Ectopic pregnancy. *Lancet.* 2005;366:583–591.
13. Peterson HB, Xia Z, Hughes JM, Wilcox LS, Tylor LR, Trussel J. The risk of ectopic pregnancy after tubal sterilization. *N Engl J Med.* 1997;336:762–767.
14. Fernandez H, Gervase A. Ectopic pregnancies after infertility treatment: modern diagnosis and therapeutic strategy. *Hum Reprod.* 2004;10:503–513.